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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/500,896
Filing Date: March 03, 2005
Appellant(s): ROTH ET AL.

MAILED

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Technology Center 2600

Guy Yonay

For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed August 20th 2007 appealing from the Office action mailed December 28th 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6304237	Karakawa	10-2001
6069601	Lind	5-2000

6972736	Wada	12-2005
20020122019	Baba	9-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-4, 6-13, 15-16, 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karakawa (6304237) in view of Lind (6069601).

Regarding claim 1, Karakawa teaches a light source to generate light of a set of at least three different chromacities by explaining the invention comprises a monochromatic red (R), green (G), blue (B) pulsed laser light source adapted for display applications, and particularly, LCD display systems. (Col 1; 59-61) Karakawa further teaches a controller to produce a light pattern corresponding to an image by selectively controlling the path of the light of said at least three primary colors by showing the schematic diagram of the monochromatic R, G, B laser light source coupled with three transmissive LCD panels as the spatial light modulators is shown in FIG. 3. Since LCD panels are totally insensitive to the pulse width modulation, this monochromatic R,G,B laser light source can be coupled with both transmissive and reflective LCD panels acting as spatial light modulators. (Col 5 lines 32-38, Fig. 3) Since the utilization of a spatial light modulator is well known in the art as an example of a controller to determine the relative location of light of each color as projected onto the view screen, Karakawa teaches the operation of a controller as a means of projecting the projection lens contents onto the viewing screen (Fig 3). However, Karakawa fails to explicitly teach a proofed image and said chromacities are selected

to define a viewed color gamut which covers said perceived color gamut of said set of inks when printed on said substrate. This is what Lind teaches. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11, Col 5 lines 10-17) It should be noted that Lind teaches soft proofing an image to be reproduced using a set of selected printing colorants (cyan, magenta and yellow) wherein the display appearance is substantially spectrally matched to the set of printing colorants. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings a viewed color gamut which covers a perceived color gamut of said inks when printed on a substrate as taught by Lind into the system of Karakawa in order to reproduce a proofed image because providing a better match to a printed reproduction than prior systems and methods can be achieved. (Col 2 lines 56-58) Further, it should be noted that Lind does not explicitly teach said defined viewed color gamut which *entirely* covers a perceived color gamut of said set of inks when printed on said substrate. Nonetheless it should be noted that a purpose of the invention that Lind teaches is to select printing colorants (viewed color gamut) wherein the display appearance is *substantially spectrally matched* to a set of printing colorants (perceived color gamut). (Col 3 lines 56-65) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the colorants of Lind to entirely cover a perceived color gamut because covering the entire perceived gamut faciliates in providing even more correctness in producing a display appearance as close as possible to a printed document.

Regarding claim 4, Karakawa teaches the light source of the display includes at least a plurality of light emitting diodes by showing the monochromatic R, G, B laser light source incorporates cw **diode laser bar** (Col 3, lines 16-17) and referring to Fig. 1, the master oscillator is coupled through output coupler to multiple Nd:YVO.sub.4 based gain modules (e.g., power amplifiers), and the average output power increases as more gain modules are added to the master oscillator. Each gain module is constructed from Nd:YVO.sub.4 crystal slab transversely pumped by one or two cw **diode laser bars**. (Col 3, lines 43-49).

Consider claim 6, Karakawa teaches at least three primary colors comprise at least four primary colors by explaining the performance goals of the monochromatic R,G,B laser light source are usually defined by the requirement for pulse repetition rate and FWHM (full-width half-max) pulse width, as well as producing high luminosity, well color-balanced white light when R,G,B laser light are mixed together. (Col 3, lines 11-15) Since the definition of white light is well known in the art as containing all the colors of the visible spectrum, the display taught by Karakawa teaches at least three primary colors comprising at least four primary colors.

Consider claim 7, Karakawa teaches wherein the light source produces light of three primary colors, the transmission spectra of which define said viewed color gamut by showing the invention presents a monochromatic R, G, B light source which incorporates digital color space conversion electronics which transfer input video signal color space into R, G, B color space created by the monochromatic R, G, B light

source, so that the resulting color spectrum is acceptable for display use. (Col 2, lines 38-42).

Consider claim 8, Karakawa teaches the displayed claimed in claim 8, comprising a spatial light modulator by demonstrating the invention includes display systems employing the monochromatic, pulsed laser light source, particularly for LCD display systems, since LCD panel (one of spatial light modulators) does not require pulse width modulation, the R, G, B pulsed laser light source may be coupled to three LCD panels (one panel for each primary color) to create a display system. (Col 2, lines 26-32)

Regarding claim 9, Karakawa teaches the display claimed in claim 9, comprising a digital micro-mirror device by showing although the specific example of three transmissive LCD panels with the monochromatic R, G, B laser light source has been discussed in detail, the invention can be coupled with other different types of spatial light modulators; such as, but not limited to: digital mirror device (DMD), two dimensional electro- mechanical, digital, mirror array device modulators, as manufactured by Texas Instruments; (Col 6, lines 43-47 and Col 6 lines 54-56).

Regarding claim 18, Karakawa teaches said controller controls path of light of said at least three primary colors based on image data (input video signal) in terms of said at least three primary colors. (Col 5 lines 32-38, Fig. 3) However, Karakawa fails to explicitly teach a proofed image. This is what Lind teaches. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11, Col 5 lines 10-17) It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings of a

proofed image as taught by Lind into the system of Karakawa in order to control path of light of said at least three primary colors based on image data representing proofed image because providing a better match to a printed reproduction than prior systems and methods can be achieved. (Col 2 lines 56-58)

Consider claim 10, Karakawa teaches selectively producing light of said at least three colors having at least three different chromaticities by showing the invention comprises a monochromatic red (R), green (G), blue (B) pulsed laser light source adapted for display applications, and particularly, LCD display systems. (Col 1, 59-61) Karakawa additionally teaches combining the light of at least said three primary colors to substantially reproduce said image by showing the schematic diagram of the monochromatic R, G, B laser light source coupled with three transmissive LCD panels as the spatial light modulators is shown in FIG. 3. Since LCD panels are totally insensitive to the pulse width modulation, this monochromatic R,G,B laser light source can be coupled with both transmissive and reflective LCD panels acting as spatial light modulators. (Col 5 lines 32-38) Since the utilization of a spatial light modulator is well known in the art as an example of a controller to determine the relative location of light of each color as projected onto the view screen, Karakawa teaches the operation of a controller as a means of projecting the projection lens contents onto the viewing screen (Fig 3). However, Karakawa fails to explicitly teach a proofed image and said chromacities are selected to define a viewed color gamut which covers said perceived color gamut of said set of inks when printed on said substrate. This is what Lind teaches. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11, Col 5 lines 10-17) It should be

noted that Lind teaches soft proofing an image to be reproduced using a set of selected printing colorants (cyan, magenta and yellow) wherein the display appearance is substantially spectrally matched to the set of printing colorants. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11) It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings a viewed color gamut which covers a perceived color gamut of said inks when printed on a substrate as taught by Lind into the system of Karakawa in order to reproduce a proofed image because providing a better match to a printed reproduction than prior systems and methods can be achieved. (Col 2 lines 56-58) Further, it should be noted that Lind does not explicitly teach said defined viewed color gamut which *entirely* covers a perceived color gamut of said set of inks when printed on said substrate. Nonetheless it should be noted that a purpose of the invention that Lind teaches is to select printing colorants (viewed color gamut) wherein the display appearance is *substantially spectrally matched* to a set of printing colorants (perceived color gamut). (Col 3 lines 56-65) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the colorants of Lind to entirely cover a perceived color gamut because covering the entire perceived gamut faciliates in providing even more correctness in producing a display appearance as close as possible to a printed document.

Consider claim 11, Karakawa teaches selectively controlling path of light of said at least three colors. (Col 1, 59-61, Fig. 3) However, Karakawa does not explicitly teach accepting image data corresponding to proofed image and converting image

data into converted data corresponding to said at least three colors. This is what Lind teaches. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11, Col 5 lines 10-17) It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings of accepting image data corresponding to proofed image and converting said image data as taught by Lind into the system of Karakawa in order to reproduce a proofed image because providing a better match to a printed reproduction than prior systems and methods can be achieved. (Col 2 lines 56-58)

Regarding claim 15, Karakawa further teaches wherein said at least three primary colors include a red primary, a green primary and a blue primary, the transmission spectra of which define said viewed color gamut by showing the invention presents a monochromatic R, G, B light source which incorporates digital color space conversion electronics which transfer input video signal color space into R, G, B color space created by the monochromatic R, G, B light source, so that the resulting color spectrum is acceptable for display use. (Col 2, lines 38-42)

Regarding claim 16, Karakawa teaches the method comprising spatially modulating the light of said at least three primary colors by explaining the invention includes display systems employing the monochromatic, pulsed laser light source, particularly for LCD display systems, since LCD panel (one of spatial light modulators) does not require pulse width modulation, the R, G, B pulsed laser light source may be coupled to three LCD panels (one panel for each primary color) to create a display system. (Col 2, lines 26-32).

Considering claim 2, Karakawa does not explicitly teach a correction filter. This is what Lind teaches. (Col 3, line 45- Col 4 line 11 and Fig. 3) It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings of a correction filter as taught by Lind into the system of Karakawa utilizing a viewed color gamut similar to perceived color gamut when printed as taught by Edge in order to employ said correction filter based on spectrum reflected from substrate because the correction filter of Lind provides the functionality of selecting particular colors based on particular ink and paper to be used in the printing process (Col 3, lines 55-61 and Fig. 3) including possible selection of cyan, magenta, yellow pixel elements to produce a resultant secondary color. (Col 4, lines 9-11)

Claim 12 is similar in scope to claim 2 and thus, rejected under similar rationale.

Consider claim 3, Lind teaches a correction filter being based on the spectrum of an intended light used to view the proofed image when printed on the substrate. (Col 3, lines 55-61 and Fig. 3) It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings of a correction filter as taught by Lind into the system of Karakawa utilizing a viewed color gamut similar to perceived color gamut when printed as taught by Lind in order to employ said correction filter based on spectrum of an intended light used to view the proofed image when printed on the substrate because the correction filter of Lind provides the functionality of selecting particular colors based on particular ink and paper to be used in the printing process (Col 3, lines 55-61 and Fig. 3) including possible selection of

cyan, magenta, yellow pixel elements to produce a resultant secondary color. (Col 4, lines 9-11)

Claim 13 is similar in scope to claim 3 and thus, rejected under similar rationale.

Regarding claim 19, Karakawa teaches said light source generates the light of said at least three colors independently of said proofed image. (Col 5 lines 32-38, Fig. 3)

Regarding claim 20, Karakawa teaches wherein producing light of said at least three colors comprises selectively prouding light of said at least three colors independent of proofed image. (Col 5 lines 32-38, Fig. 3)

Claims 21 and 22 are similar in scope to claims 1 and 10 except for the recitation of generating light of exactly three colors having three different chromaticities. Lind also teaches this. (Col 2 lines 34-55, Col 3 line 45-Col 4 line 11, Col 5 lines 10-17) It should be noted that Lind teaches select colorants being cyan, magenta and yellow. (Col 5 lines 10-17) Motivation to combine a proofed image and said chromacities are selected to define a viewed color gamut which covers said perceived color gamut of said set of inks when printed on said substrate of Lind into the system of Karakawa is given in claims 1 and 10.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Karakawa (6304237) in view of Lind (6069601) in further view of Wada (6972736)

Regarding claim 5, neither Karakawa nor Lind explicitly teaches a polychromatic source to generate polychromatic light and a color filtering mechanism to *sequentially*

generate the light of said at least three colors by filtering said polychromatic light. This is what Wada teaches. (Col 5 line 50 – Col 6 line 8, Col 15 lines 1-26, Col 16 lines 33-59, Fig. 1 and Fig. 11) It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings of a polychromatic light source with sequentially filtering into the system of Karakawa utilizing a viewed color gamut similar to perceived color gamut when printed as taught by Lind in order to generate light of at least three colors because white light emitted from a light source generating color lights sequentially via a timing generator (Col 5 line 50 – Col 6 line 8) provides a color display device of a time-division driving system, in which there occurs no perception of a color breakup caused by an action performed by a presenter, as well as the perception of a color breakup cause by eye movement. (Col 3 lines 18-25)

Claims 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karakawa (6304237) in view of Lind (6069601) in further view Baba (20020122019).

Regarding claim 17, Neither Karakawa nor Lind explicitly teaches color filtering mechanism is adapted to sequentially place at least three color filters corresponding to said at least three primary colors in path of said polychromatic light. This is what Baba teaches. (p. 1 paragraph 8, p.15 paragraph 214 and Fig. 21) It should be noted that the color wheel as taught by Baba is divided into regions provided with filters for allowing of transmitted light to be R, G, B, W C, M and Y. (Col 8, paragraph 118). It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings a color wheel of Baba into the system of

Karakawa utilizing a viewed color gamut similar to perceived color gamut when printed as taught by Lind in order to sequentially place at least three color filters corresponding to said at least three primary colors in path of said polychromatic light because a color wheel enables a plurality of color filters to be linked on a single module, thus saving on cost.

Regarding claim 14, Baba teaches passing light through a color wheel. (p. 1 paragraph 8, p.15 paragraph 214 and Fig. 21) It would have been obvious to one of ordinary skill in the art at the present time the invention was made to combine the teachings a color wheel of Baba into the system of Karakawa utilizing a viewed color gamut similar to perceived color gamut when printed as taught by Lind in order to produce light of said at least three primary colors because a color wheel enables a plurality of color filters to be linked on a single module, thus saving on cost.

(10) Response to Argument

A. With respect to claims 1-4, 6-13, 15-16 and 18-22, appellant argues the Lind and Karakawa references teach away from each other and thus, examiner has not made a prima facie case of obviousness.

Appellant argues that Lind teaches a <u>subtractive</u> color display system (i.e. filtered by a set of three colored layers of *cyan, magenta and yellow*) while Karakawa teaches an <u>additive</u> display unrelated to print proofing (i.e. display designed especially for monochromatic *red, blue and green* pulsed laser light source) Consequently appellant has argued that since the types of technology for each reference are intended to solve different problems (Karakawa teaches an RGB color display system while Lind teaches

a CMYK color display system to spectrally match colors of printing colorants) and thus, it would not be obvious to take the system of Lind and use an additive combination of colors because the colors chosen by Lind would render the device of Karakawa inoperable and thus, the combination teaches away with respect to each other. Examiner respectfully disagrees. It should be noted that appellant appears to misconstrue the teachings of Lind to be limited **only** a subtractive system and thus, the colors of the filter layers in Lind must be chosen to spectrally match only cyan, magenta and yellow. However Lind explicitly states "if desired the pigmented layers may have spectral characteristics matched to non-process colors, such as red, green and blue, or any other color..." (Col 4 lines 6-11) In other words, the Lind reference does not absolutely exclude the possibility of RGB color display system and therefore, is *not limited to only* a subtractive color system by suggesting that it is possible to substantially spectrally match additive colors such as red, green and blue to perform soft proofing. Consequently the system of Lind does not render Karakawa inoperable and thus, Lind does not teach away from the teachings of Karakawa.

In addition, appellant has argued that "while not stated in so many words", claim 1 recites an additive color system. Examiner respectfully disagrees with claim 1 necessitating an additive color system. It should be noted claim 1 merely requires "a light source generating light of a set of at least three colors having at least three different chromaticities..." Nowhere in the said claim does it require that these said chromaticities must be chromaticities of an additive color system nor does claim 1 explicitly recite said chromaticities must be red, green and blue. Furthermore appellant

has argued that Lind does not define a viewed color gamut which entirely covers a perceived color gamut. As noted in the previous final office action, examiner notes that a purpose of the invention of Lind is to select printing colorants (viewed color gamut) wherein the display appearance is *substantially* spectrally matched to a set of printing colorants (perceived color gamut). (Col 3 lines 56-65) Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to select the colorants of Lind to *entirely* cover a perceived color gamut because entirely covering the perceived gamut would facilitate in providing even more correctness in producing a display appearance as close as possible to a printed document *than substantially* covering the perceived gamut.

B. With respect to claims 1-4, 6-13, 15-16 and 18-22, appellant argues Lind and Karakawa references cannot be combined and thus, examiner has not made a prima facie case of obviousness.

Appellant argues the RGB laser light source of Karakawa cannot substantially spectrally match to one of the set of printing colors of Lind since if one were to take the set of monochromatic laser lights from Karakawa and filter them through pigmented layers described by Lind, the spectral characteristics of the light would not change because monochromatic light filtered by an filter would still be monochromatic of the same wavelength. It appears applicant **has misconstrued** the criteria for establishing prima facie case of obviousness to require that if one were to take the pigmented layers (color filters) of Lind and **physically incorporate** said layers into the system of Karakawa with the monochromatic RGB laser light of Karakawa (take the pigmented

layers of Lind and physically place them into the system of Karakawa), then the resultant of this physical incorporation must physically operate (produce a resultant spectral color match). Examiner disagrees with appellant's interpretation of prima facie obviousness. It should be noted that to establish prima facie obviousness requires there must be motivation or suggestion, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, **<u>to modify the reference</u>** or to combine reference teachings. (MPEP 2142 paragraph 3) As noted by examiner in the previous final rejection, one of ordinary skill in the art would be motivated **to modify** the teachings of Karakawa given the teachings of Lind in order to produce a proofed image because Lind provides the additional benefit of providing a better match to a printed reproduction than prior systems and methods can be achieved. (Col 2 lines 56-58) Lastly, it should be noted that Karakawa and Lind may be considered analogous art because both references teach combining three different color components to result in a generated image with Lind providing the additional benefit of generating an image to provide a better match to printed reproduction.

C. With respect to claim 5, appellant argues neither Karakawa nor Lind can be combined with Wada.

Appellant argues that Wada teaches generation of sequential color is of an additive nature and thus, since Lind teaches a subtractive color system (see above), the time-sequential filter of Wada cannot produce a subtractive color system.. Examiner disagrees with appellant's rationale. As noted above, Lind is not limited to only a subtractive color system suggesting that it is possible to substantially spectrally match

additive colors such as red, green and blue to perform soft proofing. Furthermore, as noted above, the test for prima facie obviousness is not whether physically incorporating the elements of Wada into the combination of Karakawa and Lind would produce the desired result but whether one of ordinary skill in the art would be motivated to modify the reference(s) providing some desirability of doing so. Wada is merely utilized in combination with Karakawa and Lind to show that it is known in the art to utilize a color display device with a polychromatic source generating a polychromatic light (white light) and a filtering mechanism to sequentially generate a light via filtering said polychromatic light because providing the additional benefit of a color display device of a time-division driving system, in which there occurs no perception of a color breakup caused by an action performed by a presenter, as well as the perception of a color breakup caused by eye movement. (Col 3 lines 18-25)

Appellant further argues that Wada and Karakawa teach away from one another since Karakawa teaches a monochromatic light source while Wada teaches a polychromatic light source. Examiner respectfully disagrees. Although Karakawa does teach a monochromatic light source with red, blue and green produced at the same time, Karakawa does not absolutely exclude the possibility of filtering the generated polychromatic light of Karakawa after mixing the monochromatic light sources into a single white light (Fig.3). (a polychromatic light source must generate/produce polychromatic light by definition). It should be noted that Wada may be considered analogous art because Wada along with both Karakawa and Lind teach combining three different color components to result in a generated image with Wada providing the

additional benefit of a color display device of a time-division driving system, in which there occurs no perception of a color breakup caused by an action performed by a presenter, as well as the perception of a color breakup caused by eye movement. (Col 3 lines 18-25)

D. With respect to claims 14 and 17, appellant repeats arguments set forth regarding the rejection of claims 5 and 10

See above for examiner's response to appellant's arguments of claims 5 and 10.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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